Tennessee Valley Authority

Power System Highlights

Fiscal Year 2004

Overall

TVA's power system achieved its best performance ever in fiscal year 2004.

- TVA produced about 155 billion kilowatt-hours (kWh) of electricity and earned revenues of $7.5 billion in fiscal year 2004, making it the largest public power provider in the nation.

- TVA met a record all-time demand for power of 29,878 megawatts (MW) on July 13, exceeding the previous all-time record of 29,866 megawatts set on January 24, 2003. TVA used its unique and flexible mix of fossil, hydro, and nuclear power generation, as well as renewable energy sources and a strong, reliable transmission system, to help meet this demand.

Fossil fuel plants produced about 61 percent of TVA's total generation in fiscal year 2004.

Nuclear power produced about 29 percent of TVA's generation, and hydropower produced 9 percent.

TVA's combustion turbines and renewable energy program, Green Power Switch®, generated the remainder of the fiscal year 2004 power.

Fossil Power Highlights

Net generation by the fossil system was 94.65 billion kWh in 2004. That represented the 12th year in a row of fossil system net generation greater than 90 billion kWh. With a record low level of unplanned outages, the reliability of the fossil system over the summer was the highest in history.

Fossil generating units continued to set production records.

- Twelve units — three at Shawnee, two each at Widows Creek, Colbert, Gallatin, and Johnsonville, and one at John Sevier — set all-time continuous run records during the year.

- On September 25, 2004, Widows Creek Unit 3 established a new all-time high continuous-run record for TVA's fossil system when it surpassed the 616-day record held by Johnsonville Unit 3.

- Over the past five years, 30 of TVA's 59 fossil generating units have established new continuous-run records.

Electric Light & Power magazine ranked Bull Run Fossil Plant as the nation's second-most-efficient coal-fired generating plant. The magazine has ranked Bull Run among the nation's top 10 plants for efficiency every year since 1995.

TVA continues to install selective catalytic reduction (SCR) systems or similar technologies on 25 of its fossil generating units to further reduce nitrogen oxide (NOx) emissions.

- Eighteen SCRs are operational at Allen, Bull Run, Colbert, Cumberland, Kingston, Paradise and Widows Creek Fossil Plants.

- During the summer of 2004, these SCRs removed more than 70,000 tons of NOx emissions

- NOx emissions have already been reduced by about 70 percent from mid-1990 levels.

- TVA plans to build five additional scrubbers to reduce sulfur dioxide emissions from the fossil system as part of continuing efforts to improve air quality. These scrubbers collectively will reduce emissions by more than 200,000 tons per year, resulting in an 85 percent overall reduction in sulfur dioxide emissions from the TVA fossil system since the late 1970s.

Nuclear Power Highlights

TVA Nuclear (TVAN) achieved the second-highest total generation on record in fiscal year 2004.

- TVA's five operating nuclear units produced 46 billion kWh during the year. The nuclear system's highest generation ever was 46.92 billion kWh, in 2000.

- In June, July, and August, TVA's nuclear plants delivered their second-best summer run since 1997, ending the season at 96 percent net dependable capacity, or NDC. (NDC represents the power level a generating unit can sustain, on average, during critical operating hours of the day.) The fleet's 96 percent NDC over the summer represented more than 12 billion kWh of electricity for the Tennessee Valley.

- Sequoyah Unit 1 set a new record for TVAN, generating over 10 billion kWh in 2004, the most produced in any fiscal year by a TVAN unit.

Platts Nucleonics Week ranked Sequoyah and Browns Ferry nuclear plants the two most efficient U.S. nuclear generators among those reporting production costs averaged for the three year period of 2001 to 2003. For 2003, all TVA nuclear plants, Sequoyah, Browns Ferry, and Watts Bar, ranked among the 12 most efficient nuclear generators in the country.

Fiscal year 2004 marked a major safety accomplishment for TVAN employees, who achieved the lowest all-injury and recordable-injury rates on record for TVAN.

- TVAN's all-injury rate through the end of September was 0.75 per 200,000 employee-hours worked. In addition, TVAN's recordable injury rate through the end of September was 0.18 per 200,000 employee hours worked.

The Browns Ferry Unit 1 restart continued according to plan and on budget.

- The project passed the 50 percent complete milestone in August.

- When Unit 1 returns to service, its cost-effective and clean, emission-free generation of 1,280 MW will help TVA responsibly meet growing power demands while maintaining a strong reserve margin.

In August, employees at Sequoyah completed a first-of-its-kind project for TVA nuclear power plants. Three casks of used nuclear fuel were placed in an aboveground spent-fuel storage facility at the plant, completing the first round of more such activities to come.

Watts Bar began providing tritium irradiation services for the Department of Energy in October 2003 after tritium-producing absorber rods were placed in the Unit 1 reactor during its refueling outage. The tritium irradiation process does not change the basic operations of the plant and will ensure the continued safety, security, and reliability of the nation's nuclear weapons stockpile.

Hydropower Highlights

TVA's hydro units played a crucial role in reducing power-system costs and ensuring overall reliability again in fiscal year 2004.

- Because of their rapid response time, the hydro units are scheduled and used for peaking power, when the value of power is typically the highest; for a number of ancillary services such as load following (the process of adjusting generation to meet demand); and for system stabilization.

- TVA's 29 hydropower plants and Raccoon Mountain Pumped Storage Plant generated about 17.5 billion kWh of electricity, including more than 14.6 billion kWh of conventional hydro production and approximately 2.9 billion kWh of pumped-storage production. Pumping operations at Raccoon Mountain, scheduled during low-demand hours, consumed about 3.6 billion kWh, resulting in a net hydro generation of 13.9 billion kWh.

Hydro automation and modernization efforts on TVA units continued to reduce costs, improve efficiency and boost generating output.

- TVA's Ocoee No. 1, Fort Patrick Henry, Boone, Pickwick and Wheeler hydro plants and the remaining seven of the 21 generating units at Wilson Hydro Plant were automated in fiscal year 2004. A total of 24 hydro plants now can be controlled and monitored from TVA's Hydro Dispatch Control Cell in Chattanooga. All 29 of TVA's conventional hydro plants will be automated by the end of 2005.

- Improvements to Unit 3 at Fort Loudoun, Unit 1 at Chatuge, Unit 2 at Apalachia, and Unit 2 at Watts Bar added an additional 16 MW of capacity to the TVA power system in fiscal year 2004. When TVA's hydro modernization program is completed around 2015, it will have increased system capacity by more than 750 MW.

During fiscal year 2004, TVA averted about $12 million in flood damages Valley-wide and about $1.265 million along the lower Ohio and Mississippi Rivers through its integrated management of the Tennessee River system.

In fiscal year 2004, TVA concluded the Reservoir Operations Study, a comprehensive two-year review of its policies for operating the Tennessee River system.

- As part of the study, significant scientific analyses were performed to assess how a number of alternative policies for operating the system would affect the system objectives, including flood risk reduction and protection of water quality. Based on the results of the analyses and public comment on the study, TVA staff developed a preferred alternative.

- The new reservoir operations policy was approved in May by the TVA Board of Directors and implementation began in June 2004. For a full description of reservoir changes go to Reservoir Operations Study.

To help protect water quality in relation to boating activities, TVA started the Tennessee Valley Clean Marina Initiative, which is designed to help clean up the waters of the Tennessee River system and is among many such initiatives to protect the waters boaters use across the nation.

- As part of the initiative, marinas are encouraged to support better fueling techniques, install and use pump-out systems for vessels' wastewater systems, and provide clean boating education.

- The Tennessee Valley Clean Marina Initiative certified its first marina in May 2002. There are now 39 marinas across the Valley that fly the Clean Marina flag showing their commitment to protecting the waters of the Tennessee River. View a current list of Valley Clean Marinas.

Green Power Highlights

TVA's Green Power Switch® received a top-10 ranking from the U.S. Department of Energy's National Renewable Energy Laboratory for the third year in a row. The ranking was based on customer participation rates.
In fiscal year 2004, Green Power Switch generated power at 16 solar sites, a wind park, and a methane gas facility.

Approximately 7,200 residential customers and more than 330 business customers purchased green power, which is offered by 72 local power companies.

Six new participants joined Green Power Switch Generation Partners®, a program that provides incentives and support for the installation of solar and wind generating facilities. This brings the total number of generation partners to 13. Under the program, a qualifying generation source is installed by a customer served by a participating power distributor. The entire output of the generation source is purchased by TVA as a Green Power Switch resource, and the customer receives a credit on his or her monthly power bill for the generation sold. Eight new power distributors joined the program during the year, bringing the total number of participating distributors to 14.

Transmission/Power Supply Highlights

The TVA transmission system is one of the largest in North America, having delivered 171 billion kWh of electricity in fiscal year 2004. The system has maintained 99.999 percent reliability over the past five years in delivering electricity to customers.

- Load-not-served—a measure of the magnitude and duration of transmission system outages affecting TVA customers— decreased from 9.45 system minutes in 1999 to 6.19 system minutes in fiscal year 2004, a 34 percent improvement.

- A key indicator of reliability that measures the average number of interruptions per year at customer connection points declined from 1.40 in 2000 to 0.88 in 2004—a 37 percent improvement.

TVA's transmission system comprises about 17,000 circuit miles of transmission line, including 2,400 miles of extra-high-voltage (500,000 volt) line, as well as 535 substations, power switchyards, and switching stations. There are 240,000 right-of-way acres in TVA's service area.

- During fiscal year 2004 TVA added nearly 80 miles of transmission line and 17 connection points for a total of 1,032 individual interchange and connection points.

Responding to an investigation which found that improper right-of-way maintenance was a major cause of the 2003 Midwest/ Northeast blackout, TVA renewed its focus on removing vegetation that could come into contact with power lines. This effort resulted in a new record — 176 continuous days during fiscal year 2004 without a tree-caused power disturbance.

In addition to providing reliable electric service to its own seven-state region, TVA, under separate agreements, provides system reliability coordinator services for several neighboring systems, including Associated Electric Cooperative Inc., Big Rivers Electric Corporation, and East Kentucky Power Cooperative. In fiscal year 2004, TVA also provided system reliability coordinator services for Electric Energy Inc. These agreements ensure compliance with the North American Electric Reliability Council reliability standards for the entire service territory.